IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	: 10/631,004	Confirmation No.	: 9537
First Named Inventor	: Thomas HACKL		
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TC/A.U.	: 3683		
Examiner	: D. C. Kramer		
Docket No.	: 037068.52641US		
Customer No.	: 23911		
Title	: Device for Controlling Brakes in a Commerical Vehicle		

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
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Sir:

On June 10, 2005, Appellant appealed to the Board of Patent Appeals from the final rejection of claims 1-11. The following is Appellant's Appeal Brief submitted pursuant to 37 C.F.R. §1.192.

REAL PARTY IN INTEREST

The real party in interest is Knorr-Bremse Systeme fuer Nutzfahrzeuge GmbH, Moosacher Strasse 80, D-80809 Muenchen, Germany, as noted in an Assignment from the inventors to Knorr-Bremse Systeme fuer Nutzfahrzeuge GmbH, and recorded in the U.S. Patent and Trademark Office at Reel 014826, Frame 0019.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

The application contains claims 1-11. Claims 1 and 9 are independent claims, and claims 2-8 and 10-11 are dependent claims.

STATUS OF AMENDMENTS

Subsequent to the Final Office Action of March 10, 2005, Appellant submitted an Amendment After Final on June 10, 2005. An Advisory Action issued June 9, 2005 indicating that the Amendment After Final, while entering the proposed amendment to correct a typographical error, did not place the application in condition for allowance.

SUMMARY OF CLAIMED SUBJECT MATTER

Appellant's invention, as defined by independent system claim 1 and method claim 9, concerns an improved system and method for controlling brakes of a commercial vehicle (see paragraph 6, for example). An adaptive cruise control (ACC) system modulates an urgency signal that is based upon a hazard variable, such as the relative speed and/or distance between vehicles (see paragraph 2). An electronic braking system (EBS) known for use in commercial vehicles affects a distribution of a desired amount of braking force between a friction brake and an additional active retarding brake (see paragraph 3). This is done, for example, to "blend" the braking forces between the friction brake and the retarding brake in an effort to generate the desired braking force while minimizing wear and tear on the friction brakes, thus extending their useful life.

Appellant's claimed system and method utilizes the EBS system to distribute the desired amount of braking force to the friction brake and the additional active retarding brake based upon the urgency signal (see paragraphs 16 and 13-15, as well as paragraph 9, for example).

As shown in Figure 1, the EBS system 12 receives the urgency signal "d" in order to vary the "blend" between the active retarder 4 and the friction brakes 2. As also shown in Figure 1, known ACC systems signal both the EBS control 12 and an engine drive control 14 in accordance with an urgency evaluation performed in the ACC system 6, 8 (see paragraph 14, for example). Under such circumstances, a commercial vehicle EBS system would blend the friction brakes 2 and the additional active retarding brake 4 in a solely time dependent manner (see paragraph 15). Appellant's invention, however, utilizes the urgency signal "d" in the electronically controlled brake system to vary the "blend" i.e., to distribute the desired amount of braking forces between the friction brake and retarding brake, in a manner that is not solely time-dependent, but rather based upon the urgency. For example, at high urgency values, the desired braking force is distributed to the friction brakes 2 and the retarding brake 4 in order to achieve the fastest possible application of the brakes, while at low urgency values the retarding brake 4 is maximally utilized in order to minimize wear and tear on the friction brakes 2 (see paragraph 17).

Each of Appellant's independent claims 1 and 9 recite the distribution of a desired amount of braking force to a friction brake system and an additional active retarding brake based upon or as a function of the urgency signal.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are on appeal:

1. Are claims 1, 2, 9 and 11 obvious over SETO (US 2002/0152015) in view of CHAKRABORTY et al. (US 5,839,534)?

2. Are claims 3-4, 5-6 and 10 obvious over SETO in view of CHAKRABORTY?

3. Are claims 7 and 8 obvious over SETO in view of CHAKRABORTY and further in view of WIEDER (US 5,864,285)?

ARGUMENT

Independent Claims 1 and 9, and dependent claims 2-4 and 10

The primary SETO reference is directed toward an adaptive cruise control system for automotive (not commercial) vehicles and does not disclose or suggest the use of an additional, active retarding brake, but rather utilizes a passive engine torque control for decelerating the automobile under non-urgent circumstances, such as when there is no preceding vehicle (see paragraph 31, for example). Indeed, SETO's use of engine torque control is generally disclosed as background information in Appellant's specification as that which is a part of known ACC systems, wherein the ACC system reacts in accordance with the driving situation by reducing engine torque and, if necessary, automatically applying the brakes (see paragraph 14, lines 8-15 for example).

Figure 1 of SETO shows the ACC controller 4 interacting with the service brake system 5 and the engine control system 6, similarly to that portion of Appellant's Figure 1 wherein the ACC control 8 allocates braking to engine drive 14 and the service brake system 12 via control signals "a" and "M". SETO describes that the CPU of ACC controller 4 is responsible for storing the engine-torque-control/brake-fluid-pressure control programs (see paragraph 22). As such, SETO distinguishes between engine torque control achieved through the engine control system and active brake control achieved through the brake-fluid pressure control system (see paragraph 22). SETO describes two operating modes for the ACC controller – one utilizing only the engine-torque-control via the engine control system 6, and one utilizing both the service brake and engine torque control 5, 6 (see paragraph 22, last 8 lines).

SETO's engine-torque-control is thus not an "additional active retarding brake" as such term is understood to one of skill in the art based on Appellant's teachings. Rather, SETO's engine-torque-control simply corresponds to the known drive engine control (14 of Appellant's Figure 1) to reduce engine torque (see paragraph 14).

Hence, no where does SETO disclose, suggest, or even hint at utilizing an additional active retarder as part of an EBS system in the distribution or "blending" of the desired amount of braking force using the friction brake and the additional active retarding brake. In fact, no where does SETO even discuss the alleged corresponding "electronically controlled brake system", which the Examiner erroneously refers to as the brake-fluid pressure control system 5.

Nor are these deficiencies remedied by CHAKRABORTY. The Examiner refers to CHAKRABORTY because it merely references that retarders may be categorized as engine brakes. However, Appellant does not dispute this fact. Indeed, Appellant himself refer to "the additional retarding brake [taking] the form of an engine brake or a retarder" (see paragraph 3, lines 4-6). In that regard, CHAKRABORTY likewise teaches only that which Appellant describes in the prior art as utilizing the engine retarder (for example Appellant's retarder 4 shown in Figure 1) when intelligent cruise control is engaged. There is no teaching or suggestion, however, of distributing the desired amount of braking force to the friction brake and the retarding brake based upon an urgency signal modulated by the ACC system based upon a hazard variable. Indeed, neither SETO nor CHAKRABORTY teach or suggest Appellant's novel invention.

Moreover, one skilled in the art would not combine SETO and CHAKRABORTY in the manner fashioned by the Examiner here. SETO's engine control system 6 reduces engine torque in a "passive" manner as is known in the art. By contrast, the retarders and engine brakes referenced in CHAKRABORTY are active retarders and thus vastly different from the engine drive control of SETO. As Appellant's explained above, SETO's engine control system is comparable to the engine drive 14 shown in Figure 1, whereas CHAKRABORTY's discussion of retarders references Appellant's retarder 4 shown in Figure 1. As such, it appears the Examiner is likely confused by the "engine brake" terminology found in CHAKRABORTY and the "engine control

system" found in SETO. In view of the above, Appellant submits independent claims 1 and 9 are patentable over SETO in view of CHAKRABORTY.

Summarizing, Appellant's system claim 1 is provided to control brakes of a commercial vehicle. The system includes an adaptive distant regulation and/or driving speed device, i.e., in other words an intelligent system such as a known ACC system. Claim 1 also requires an electronically controlled brake system, such as an EBS system for commercial vehicles, which is designed to distribute braking force between a friction brake and an additional retarding brake (see ¶ 3). Applicant's system advantageously utilizes an urgency signal from the ACC system to control the distribution of the braking force to the friction brake and the retarding brake in accordance with the EBS system. Specifically, claim 1 recites "wherein the electronically controlled brake system distributes the desired amount of braking force to the friction brake system and the retarding brake based upon the urgency signal". That urgency signal is modulated by the adaptive distance regulation and/or driving speed device, i.e., the ACC system.

Appellant's background of the invention acknowledges that ACC systems, which modulate an urgency signal, and EBS systems, which "blend" in a time-dependent manner the transfer of braking force between the friction brake and retarding brake, are known. (See ¶¶s 2 and 3).

The so-called brake "blending" function (also called "endurance brake integration" or "retarder blending") effectively distributes the braking force between endurance brakes, such as retarders, engine brakes, etc., and foundation brakes, such as pneumatic disc brakes, in accordance with a fixed

scheme. That scheme utilizes as much braking force as is possible from the endurance brakes, which are "wear resistant", with the remaining necessary brake force desired from the foundation brakes. Such a fixed brake force distribution scheme is not suitable for ACC and other driver assistance systems. Those systems sometimes require very fast reaction (the low dynamics of the endurance brakes must be compensated by the fast reacting foundation brakes) but, most of the time, they attempt to avoid lining wear (foundation brakes shall only be used if the endurance brakes are not capable of providing the desired deceleration).

In view of the above, Appellant's invention is directed toward novelly influencing the brake force distribution within the EBS system depending upon an urgency value generated and sent by the adaptive distance regulation and/or driving speed system, i.e., the ACC system.

By contrast, SETO is only directed toward an ACC system that operates or addresses a "plurality of braking-and-driving force control systems" (see claim 1). SETO addresses one "braking-and-driving force control system" for accelerating the vehicle, i.e., the engine, and another "braking-and-driving force control system" for decelerating the vehicle, i.e., engine/friction brakes. This operation conforms generally to that of every ACC system on the market. No where does SETO disclose using a hazard based urgency signal to influence the brake blending of an EBS system, which EBS systems are now state of the art in commercial vehicles.

In the Final Office Action, the Examiner argues that Step 006 shown in SETO's Figure 2 and described in ¶¶s 31 and 32 provide a modulated urgency signal that controls an EBS system. Appellant respectfully submits that SETO does not provide an EBS system, nor does SETO suggest or hint at controlling the distribution or "blend" of an EBS system based on an urgency signal from an ACC system. The Examiner's reference to the brake-fluid pressure control system 5 as being an EBS system is not supported in SETO, nor would it be considered an EBS system to those of ordinary skill in this art. EBS systems are well known and, as noted above, the brake blending functions thereof are traditionally not suitable for use with ACC and other driver assistance systems. Regarding Step S006 in Figure 2, this step merely shifts between the "braking-and-driving force control" systems traditionally used with an ACC system, such as the engine control system 6 and the brake-fluid pressure control system 5 depending upon whether a preceding vehicle is present or not.

Reiterating, nothing in SETO discloses or suggests Appellant's claimed distribution by an EBS system of "the desired amount of braking force to the friction brake system and the retarding brake based upon the urgency signal" from the "adaptive distance regulation and driving speed device".

In view of the foregoing, neither SETO nor CHAKRABORTY alone, or in combination, disclose, suggest or even hint at using an urgency signal to influence the strategy of the brake blending function of modern EBS systems. As such, Appellant respectfully submits claim 1, which recites an "electronically controlled brake system designed to distribute a desired amount of braking force

to a friction brake system and an additional active retarding brake", and to do so "based upon the urgency signal" is patentable over CHAKRABORTY in view of SETO. Similarly, Appellant's independent method claim 9 recites the act of "distributing a desired amount of braking force to a friction brake system and an additional active retarding brake as a function of the urgency signal using an electronically controlled brake system", and is likewise patentable.

Claims 5, 6 and 11

Claims 5, 6 and 11 specify either a further control device in the electronically controlled brake system (claims 5 and 6) or the further method act (claim 11) for distributing, at high urgency values, the desired amount of braking force to the friction brake system and the retarding brake in order to a achieve a fastest possible application of the brakes, while at low urgency values the distribution maximally utilizes the retarding brake in order to reduce wear and tear on the friction brake system.

Neither SETO nor CHAKRABORTY disclose and/or suggest an EBS system for blending the braking force, let alone one that does so based upon an urgency signal from an ACC system. As such, they cannot teach or suggest distributing to the friction brake system and retarding brake in order to achieve a fastest possible application of the brakes at high urgency values, while maximally utilizing the retarding brake in order to reduce wear and tear at low urgency values. Accordingly, Appellant submits claims 5, 6 and 11 are separately patentable over CHAKRABORTY.

Claims 7 and 8

Appellant's system claims 7 and 8 further recite the use of a CAN databus to transmit the urgency signal from a further control device in the at least one adaptive distance regulation and driving speed device to the electronically controlled brake system control device.

In the final Office Action, these claims were rejected as obvious over SETO, CHAKRABORTY and WIEDER. As an initial matter, Appellant objects to the Examiner's assertion that SETO teaches the use of "what can be considered a CAN data bus". No where does SETO describe the use of a CAN data bus. Even still, the use of the well-known CAN data bus in a vehicle is not in and of itself novel, but rather its use pursuant to the claim language for transmitting the urgency signal from a further control device to the electronically controlled brake system control device.

In view of the above, the Examiner's reference to WIEDER, which describes the use of a CAN data bus, still fails to teach or suggest Appellant's claimed invention. There is simply no suggestion or motivation for one of skill in the art to use the CAN data bus in Appellant's claimed manner. As such, Appellant submits claims 7 and 8 are separately patentable over SETO in view of CHAKRABORTY and WIEDER.

APPENDIX

A copy of the claims on appeal is enclosed herewith.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

As there are no related proceedings, no appendix is provided.

CONCLUSION

For the above reasons, Appellant respectfully submit that the decision of the Examiner in finally rejecting claims 1-11 is erroneous and should be reversed.

This Appeal Brief is accompanied by a check in the amount of $500.00 in payment of the required appeal fee, along with a two month extension of time petition fee in the amount of $450.00 under 37 C.F.R. 1.136(a).

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #037068.52641US).

Respectfully submitted,

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1. A system for controlling brakes of a commercial vehicle, comprising:

at least one of an adaptive distance regulation and driving speed device which modulates an urgency signal based upon a hazard variable;

an electronically controlled brake system designed to distribute a desired amount of braking force to a friction brake system and an additional active retarding brake; and

wherein the electronically controlled brake system distributes the desired amount of braking force to the friction brake system and the retarding brake based upon the urgency signal.

2. The system according to claim 1, wherein the hazard variable is at least one of a relative speed and distance to a vehicle traveling in front of the commercial vehicle.

3. The system according to claim 1, wherein a value range of between 0% indicating no urgency and 100% indicating a greatest urgency is provided for the urgency signal.

4. The system according to claim 2, wherein a value range of between 0% indicating no urgency and 100% indicating a greatest urgency is provided for the urgency signal.

5. The system according to claim 3, wherein the electronically controlled brake system includes a control device such that at high urgency values the desired amount of braking force is distributed to the friction brake

system and the retarding brake in order to achieve a fastest possible application of the brakes, while at low urgency values the retarding brake is maximally utilized in order to reduce wear and tear on the friction brake system.

6. The system according to claim 4, wherein the electronically controlled brake system includes a control device such that at high urgency values the desired amount of braking force is distributed to the friction brake system and the retarding brake in order to achieve a fastest possible application of the brakes, while at low urgency values the retarding brake is maximally utilized in order to reduce wear and tear on the friction brake system.

7. The system according to claim 5, wherein a CAN data bus transmits the urgency signal from a further control device in said at least one adaptive distance regulation and driving speed device to the electronically controlled brake system control device.

8. The system according to claim 6, wherein a CAN data bus transmits the urgency signal from a further control device in said at least one adaptive distance regulation and driving speed device to the electronically controlled brake system control device.

9. A method for controlling brakes of a commercial vehicle, the method comprising the acts of:

modulating an urgency signal based upon a hazard variable via at least one of an adaptive distance regulation and driving speed device;

distributing a desired amount of braking force to a friction brake system and an additional active retarding brake as a function of the urgency signal using an electronically controlled brake system.

10. The method according to claim 9, wherein the urgency signal has a value of 0% that indicates no urgency and 100% that indicates a greatest urgency.

11. The method according to claim 9, wherein the act of distributing the desired amount of braking force further comprises the act of distributing at high urgency values the desired amount of braking force to the friction brake system and the retarding brake in order to achieve a fastest possible application of the brakes, while at low urgency values the distribution maximally utilizes the retarding brake in order to reduce wear and tear on the friction brake system.